TACOM-Rock Island Safety Office

RADIATION SAFETY INFORMATION BULLETIN

Issue 1-03

March 2003

Special points of interest:

- **2003 Workshop July 28**
- **Safety Office changes**
- **Bioassay's are expensive … use them appropriately**
- **MC-1 license changes**
- **Hazards of DU**

INSIDE THIS ISSUE:

DEPLETED URANIUM

With the war in Iraq now in progress, it is important to review DU and the issues that surround its use. What is DU, what are its hazards and what precautions should be taken when around expended DU rounds?

Uranium is a heavy metal that is part of our natural environment and is found in the air, water, and soil throughout the world. In the US, uranium is found in amounts large enough to be mined in the southwestern states of New Mexico, Arizona, Colorado, Utah, and even Wyoming.

It is a pyrophoric metal which ignites on impact and penetration of a heavy metal target.

Fifty years of intensive research on uranium have shown that natural uranium's health effects are comparable to those of other heavy metals such as lead and tungsten. Natural uranium is put through an enrichment process, which removes most of the U235 and U234 for use as reactor plant fuel. This process results in a less radioactive byproduct known as Depleted Uranium (DU). DU is a dense, shiny metal used by the US and other armed forces in munitions, armor,

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It's in the Bag!

If you have a fire control device with a broken or potentially broken tritium source, what do you do with it? My hope is that most of you would answer with my favorite chant "bag it, tag it and call the RSO!" If so, great; you've been listening to our message over the years.

So, let's take that thought a bit further and consider what kind of bag you've been using on these items. Think for a moment! What are you bagging?

It's tritium, a gas, which is nothing more than radioactive hydrogen. And this gas is impossible to contain in any material, because it is a highly interactive element. Even an undamaged Pyrex vial has a slight leak rate for tritium.

If you've got a broken or potentially broken fire control device… " bag it, tag it and call the RSO."

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IT'S IN THE BAG:

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The average plastic trash bag is 1 to 1.5 mils thick and opaque (either white or black). The plastic bag in the wastebasket here in the office (like the bags most of us use) is about 0.5 mils. The thickest plastic bags we have been able to find commercially are those intended for use in a trash compactor. These were 3 mils thick. The problem is a thin bag is not going to hold tritium for very long even if using two bags.

Use the thickest bag available to maximize containment of tritium.

So where are we going with this?

For years we have been telling you to double bag broken tritium devices. But the mil thickness of the bags makes a world of difference! It is important to use bags with a mil thickness greater than those generally used (1 to 11/2 mils). It is important to use the thickest bags available to maximize containment of tritium. However, double bagging is not the end of the story, even if you have the thickest plastic bags available.

When a device with a broken source is double bagged it is very important for the Radiation Safety Officer (RSO) to move the package to a radiation storage area. Failure to do so can result in tritium contamination of the area where it remains.

The installation RSO must insure that double-bagged fire control devices are placed in a plastic lined metal drum.

The Installation RSO must insure that double-bagged fire control devices are placed in a plastic lined metal drum, in an established holding area for unwanted radioactive material.

fire control devices with broken tritium sources cannot be shipped

It is very important to remember, fire control devices with broken tritium sources cannot be shipped to a "Center of Excellence" maintenance facilities or any other facility for repair. As stated earlier, tritium cannot be sufficiently contained by plastic bags and could cause contamination outside the packaging in violation of the Code of Federal Regulations transportation limits, during transit. Fire control devices with known or suspected source damage must be retained at the Camp, Post or Station until the Rad Waste Office can take custody and transport them to an acceptable Rad Waste Disposal sight.

So, not only should we "bag, tag and contact the RSO", we need to ensure the bags are of sufficient thickness and that the bagged item is removed from the incident sight and placed in an appropriate Rad Storage Area.

Double bag it, tag it, call the RSO, have it removed to a holding area and place it in a plastic lined metal drum as soon as possible.

A TYPICAL TRITIUM INCIDENT

A howitzer firing Section had just completed an air assault operation. While unloading one of the CH 47s, an M1A1 Collimator, housed in its carrying case, was dropped onto the ramp of the helicopter. The soldier picked it up and put it into the back of the hummer along with the rest of the equipment, without checking it's condition.

During pre combat checks for the next mission, it was discovered that the M1A1 Collimator was not illuminating. After notifying his section leader the responsible individual was instructed to put it back into its case and back in the hummer. The Section Leader then searched and found a replacement collimator to use in place of the non-illuminating device. The broken collimator remained in the back of the hummer for the next week or so.

During the download of equipment after the unit redeployed back to home base, the broken collimator was put into a POV and taken to the billets where it was stored in the Smoke's office and later the supply room office for approximately 4-6 weeks.

Eventually, upon turn-in of the broken collimator, the Installation Radiation Safety Officer (IRSO) was informed of the collimator's condition.

The IRSO asked several question: "When was it broken? Where was it stored? When was it broken? How was it transported? And who noticed it was broken?"

The IRSO then notified the Licensee with the following information: 1) I have an unbagged, broken M1A1 colli-

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mator; 2) the collimator has been broken for approximately 5-6 weeks; and 3) it has been stored and moved between two offices during this time. He then closed down the two work offices and performed initial wipe tests.

Within a few days the NRC was threatening to show up and the licensee was on site to provide guidance and be available to the NRC if they actually should show up. Decontamination of the two offices and follow-up wipe surveys were performed until all wipes came back "clean." Both offices were closed for approximately two weeks and bioassays were collected from 10-14 personnel. The results came back indicating that only a few of the individuals had received any uptake, all of which were well below limits. However, an uptake, no matter how minute, is considered too much.

Wipe surveys were also taken in the Section Leader's POV trunk and his home. It was determined that the trunk and the areas of his house tested, were not contaminated. Imagine the stress his spouse experienced! And him later!!!

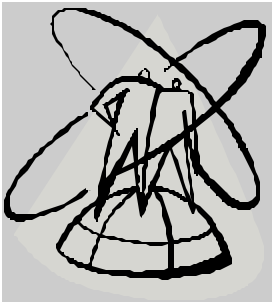
The Root Causes for this incident were:
No Unit RPO assigned; and no user training.
Without user training, those who use the collimator, or any other tritium containing devices, had no idea of the possible consequences from dropping these items. They didn't know about bagging, tagging, or segregation. Nor did they know about notification, use of POV's or proper storage. These soldiers had no idea what equipment in their unit contained radioactive material and without a Unit RSO no training had been conducted. An RSO could have prevented all of these shortcomings.

Actions taken to prevent reoccurrence:
Mass training was conducted for the unit. The training covered what equipment contained radioactive material, emergency procedures, notification procedures and storage requirements.

Secondly a Unit RSO was identified and appointed in writing.

In this case, as in most all other cases, user training could have prevented, or at least greatly reduced the severity of this incident.

2003 Radiation Workshop



The 2003 Rad Safety Workshop is a GO! We are planning the Workshop for the week of July 28th. It will be held here in the Quad Cities, but we haven't made our final selection of the particular facility. We are still open to any suggestions as to facility, topics or speakers but look to start nailing these down within the next two months.

If you have any suggestions/ideas as to these issues, forward them NOW, so we can present a workshop that addresses your issues. We look forward to having our BEST workshop ever!

It would also be helpful for us to get some idea of the numbers who might see there way clear to visit the workshop this year. If you know (or think) you would attend this year, drop us an e-mail at mohst@ria.army.mil or amsta-cs-czr@ria.army.mil.

Your responses would be greatly appreciated!

We've Changed

Things have changed here at the TACOM-RI Safety office.

We have a new boss, Jeff Havenner! Many of you know Jeff from his many years as the License RSO. Well! Now he be the boss!! And we are working to fill his former position as the RSO!

Another change is our direct report level. We are now part of the TACOM-Warren Safety Office and answer directly to Mr. Nicholas Straffon.

Our phone numbers and e-mail addresses remain the same. However, our office symbol has changed. Please note the new office symbol: AMSTA-CS-CZR.

Congratulations to Jeff Havenner!

COMMON COURTESY … GOES A LONG WAY!

Hey, the neighbors sent us their old silverware set. The note says they bought a new set and wanted us to have their old one. It says they remembered we'd been wanting to replace our silverware and thought we would enjoy it. What a great couple! Lets check em out!

HEY! What the heck is this!!! This stuff is filthy … there's food on some of the pieces. Where do they get off giving us this kind of stuff! I'll tell them a thing or two … give me the phone! Pack it up we're sending it back!

MAN!! What's this world coming too?!!

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This sort of thing would never happen in the real world … or would it? Actually, it happens all the time in the "Rad world".

We send radioactive items from one place to another with "garbage" (contamination) all over it ... and expect them to accept it. After all, we've sent it to the right place, we properly notified them and we even paid for the shipment.

Hey! It's their job to take the stuff and repair it for us. It's their job to store the stuff for us. It's their responsibility to calibrate it! What's the problem?

Think about it! If the neighbors had taken the time to check their silverware before sending it off to their friends, they would have noticed it was a mess, and cleaned it before sending it off? **Common courtesy**!!

Well, the same holds true in the "Rad world". If we would check out radiological items before we package them (i.e. wipe survey), we'd notice any contamination and clean it up or NOT ship it! **Common courtesy** (i.e. good radiological practices), would compel us to clean it up before sending it to another installation.

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Anytime you are going to transfer radioactive material to another person or place, check the item and/or the bags you've placed it in for contamination prior to the transfer. It would also be a courtesy to include any surveys with the transfer. Likewise, before you accept a radioactive item into your inventory, you ought to ask for the results of the contamination survey, if it is not with the package.

You check the condition of food and other goods before you purchase and place them in your pantry! Why be different here??!! Besides, the Code of Federal Regulations for transportation (49 CFR) requires checking the radioactive material for contamination prior to shipping (49 CFR 173.443 & .474) and requires checking items upon receipt (10 CFR 20.1906). The result of not checking (and cleaning) an item prior to packaging and/or receiving it, has consequences.

With tritium you won't get sick. But, you might wish you had, if you contaminate someone's work place, or worse … an individual! **Cleanup can be expensive!** Bottom line, folks, use **common courtesy** and good rad practices, when sending or receiving radioactive material. You'll keep your fellow rad workers out of trouble!

For transportation, contamination, wipe survey or any other radioactive material related questions contact the TACOM-RI Safety Office at (309) 782- 6228 or DSN 793-6228 anytime.

We're here to help you be safe out there!

MC-1, License Amended!!!

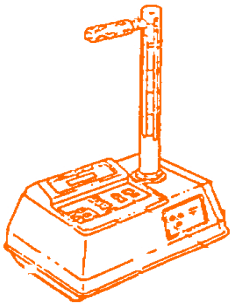
In case you didn't hear the latest, the NRC license for the MC-1, Soil Moisture and Density Tester, managed by TACOM, has just been amended! NRC license number 21-01222-05 is now working under amendment 13, with an expiration date of September 30, 2012. You can print a copy of this new amendment by going to the DA RSO Reference Guide website at http://www.monmouth.army.mil/rso/nrclicen/01222-05.pdf. With this amendment there are a few major changes that will affect the way the MC-1 Radiation Safety Program (RSP) is implemented.

So, what are the changes, you ask? Well, here they are:

There is no longer a need to have a trained and appointed ALRSO (Unless your MACOM requires it). You are only required to have a trained and appointed LRSO.

Local Radiation Safety Officer (LRSO):

There is no longer a need to have a trained and appointed ALRSO, unless your MACOM requires it. You are only required to have a trained and appointed LRSO, but remember if this person is not available you must suspend the use of the MC-1 until a trained LRSO is available. So, you can see it would be a good idea to have more than one person trained to be an LRSO even though you only need to appoint just one person. Having an extra person trained would enable you to appoint this person as the LRSO should the need arise, thus limiting the down time of the MC-1, since units may not use the MC-1 for mission requirements until a qualified LRSO is trained and appointed. The LRSO training will consist of the following topics: Principals and Practices of Radiation Safety; Biological Effects of Radiation; RADIAC Instrumentation and Monitoring Techniques; Mathematics and Calibrations that are basic to the use and measurement of radioactivity; and the operation and use of the MC-1.



The following courses have been approved to qualify an individual as a LRSO for the MC-1:

1. Radiological Safety Course, 7K-F3-494-F14, US Army Chemical School
2. Operational Radiation Safety Course, 4J-F2-494-F9, US Army Chemical School
3. Calibrator Custodian Course, US Army Chemical School and Technical Engineers Course (51T), US Army Engineer Center.
4. Army National Guard RSO Course, CECOM
5. USAREUR Local Radiation Safety Officers Course
6. Any other training course approved by the TACOM Safety Office.

Surveys:

Radiological Surveys are required to be performed semiannually (no longer quarterly) and documented. Background, initial, change and close-out surveys will continue to be performed as required and forwarded through command channels to TACOM.

The interval for the performance of radiation surveys of the MC-1 storage area has been changed from quarterly to semiannually. This survey has to be performed by LRSO and cannot be performed by an operator. Along with this semiannually requirement, radiation surveys must be performed when you first set-up a storage area, to include a background survey prior to placing the MC-1 in the area and an initial survey once the MC-1 is placed in the area. Also, changes to the storage area require a survey. A closeout survey must be performed if you will no longer store the MC-1 in the area. Copies of the background, initial, change and closeout surveys will be forwarded through the chain of command to TACOM.

Leak Testing:

Leak tests of the sources is now required to be performed annually (no longer semiannually). Leak tests to be performed by the LRSO and operators. Certification of the operator must be provided to TACOM to validate the performed leak test.

The interval for the performance of a leak test on the MC-1 has been changed from semiannually to annually. The leak test will be performed by the LRSO, in the event the LRSO is not available a certified operator can be designated to perform the leak test. Certification of the operator must be provided to TACOM to validate the performed leak test. Non-unit bulk storage areas (i.e. ECS, etc.) are not required to perform an annual leak test. They however, must provide a memo indicating who their LRSO is, serial number of testers, confirm the storage location and the non-use of the tester and that it is properly stored. Remember to file a copy of the leak test results so, that they are available for review by an inspector, for a period of three years.

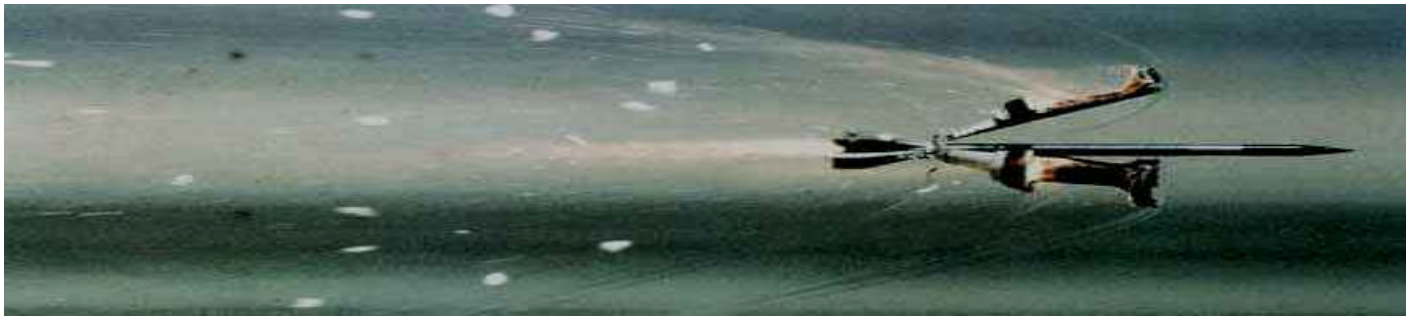
Dosimetry:

Dosimetry exchange-out frequency for deployment is quarterly. Otherwise, it is monthly except for Non-unit bulk storage areas (i.e. ECS, etc.). non-unit bulk storage areas (i.e. ECS, etc.) are quarterly.

How about that…the requirements for the MC-1 RSP have actually been eased; usually we are issuing more stringent requirements.

Who says there's no Santa Claus?

DEPLETED URANIUM: CONTINUED FROM PAGE 1



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and other applications. As a pyrophoric material, the DU penetrator is ideal as a armor-piercing kinetic energy ammunition.

Depleted uranium is not an immediate health hazard while it remains outside the body. The primary health concern with DU, if it enters the body, is heavy metal toxicity, with a secondary concern of radioactivity. The lungs, kidneys and bones may be affected, depending on the method of entry into the body. Although DU is an alpha emitter, the energy of the radioactivity is so low that it does not pose a significant health hazard.

DU is not an immediate health hazard if it remains outside the body.

DU munitions are identifiable by their black color with white markings on the projectile end and is used in 20mm, 25mm, 30mm, 105mm, and 120mm ammunition. By license, DU munitions may only be fired during war time. Any peacetime firing of DU is prohibited, except on ranges with special NRC license agreement and containment features. DU munitions may not be disposed of by burning, detonating, or burial, nor can they be stored with pyrotechnics or incendiary type munitions.

Depleted uranium has also been integrated into tank armor to ensure maximum crew survivability and provides increased protection against a broad spectrum of antitank weapons. The same qualities that allow DU to penetrate other less dense metals also mean that these less dense metals cannot easily penetrate DU. Therefore, the M1A1/A2 Abrams (Heavy Armor) tanks employ steel-encased DU for increased armor protection. A printed "U" at the end of the turret serial number will identify tanks with Depleted Uranium shielding.

... limit or even eliminate the potential of taking DU into your body by rolling down sleeves, blousing your boots and using respiratory protection when in an area with spent DU rounds, and washing your hands after handling DU.

As stated earlier, DU is an internal hazard. Therefore it is important to protect yourself in a DU environment and avoid inhalation, ingestion or injection of DU particulate or oxides. You can limit or even eliminate the potential of taking DU into your body by rolling down sleeves, blousing your boots and using respiratory protection when in an area with spent DU rounds, and washing your hands after handling DU. If you come upon a target destroyed by a DU round, it is extremely important to take measures to prevent uptake. Remain up wind of the area and place a scarf or other material over your nose and mouth to filter out any DU dust. If it is necessary to approach the area, limit your time in the immediate area and dust off clothing upon leaving and take care to wash all exposed area of skin as soon as possible.

AVOID expended DU rounds and damaged tanks

If the encasing metal around DU armor is ruptured, exposing the DU, take immediate measures to cover the exposed area until repairs can be implemented. Any material can be used to cover the area, by simply taping it over the exposed DU. DO NOT perform welding in or on the area without proper DU welding procedures and precautions.

The best advice is to avoid expended DU rounds if it is not your responsibility to collect them. Likewise, avoid damaged tanks if it is not your responsibility to inspect the damage!

DU General Awareness training materials, developed by the US Army Training and Doctrine Command, can be accessed at: http://www.wood.army.mil/84chem/hhc/ttd/du.htm

Additional information on DU is available at: http://www.deploymentlink.osd.mil/du_library/

WHO NEEDS A BIOASSAY

Personnel who work with or around tritium sources are being exposed to a potential tritium uptake. Potentially exposed individuals include users, shipping and receiving personnel, stock/storage personnel, DS/GS level maintenance, and depot level maintenance workers. Those who are thus exposed have a desire to know what radiation dose they may have received from that exposure. Furthermore, the licensee has a mandate from the Nuclear Regulatory Commission (NRC) to measure and report any dose to personnel exposed to radioactive materials authorized under the NRC License.

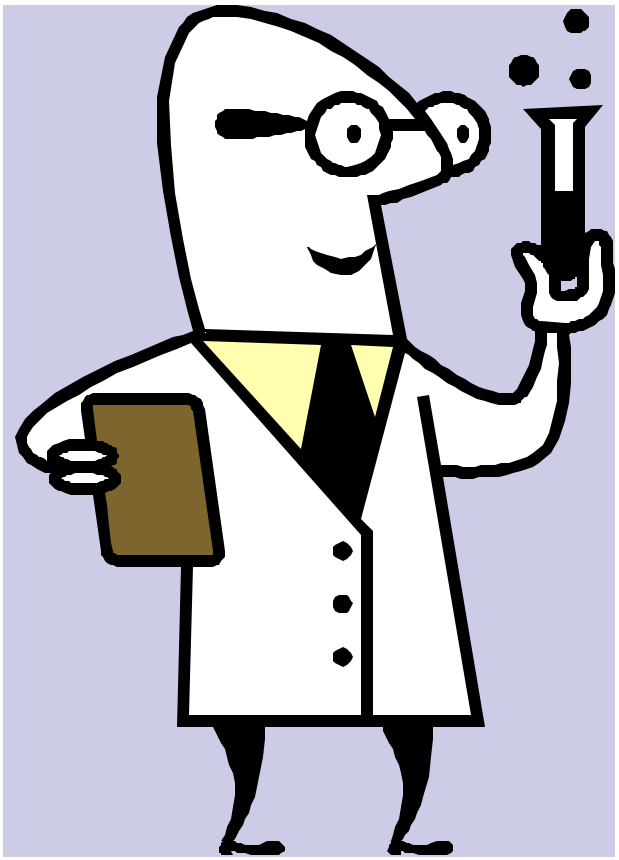
Yet, an external dosimeter cannot detect the low energy Beta given off during tritium decay. Because of this another method for tracking tritium uptake must be used. That method is the bioassay.

The preferred bioassay method for tritium is a sampling of bodily fluids, specifically urine.

A bioassay is a sample of material which is analyzed separate from the source of that material. The preferred bioassay method for tritium is a sampling of bodily fluids, specifically urine. This urine bioassay is analyzed for the presence of tritium and the level of tritium in the urine is indicative of the tritium throughout the bodily fluids. From this information a determination can be made as to the level of exposure and the resulting dose to the individual.

So! Everyone who handles a device containing tritium needs a bioassays on a regular basis, right? No!

We don't bioassay everyone, potentially exposed, because other controls are in place to minimize measurable exposures to tritium. Tech manuals and work procedures provide instructions on how to minimize exposure. Design criteria and source size minimize the potential for significant tritium exposure. And finally, established contamination controls, if properly implemented, minimize the presence of tritium contamination in the work area. Additionally, real life, bioassay, case histories show that tritium uptake in personnel working in higher risk circumstances have been minimal to not measurable in all but a few worst case incidents.



So, who does need a bioassay and how frequently should they be done?

First, those who are directly involved in a tritium release or who actually handle a broken device/source. The need for this bioassay should be determined by the RSO in conjunction with medical personnel and is a function of the potential uptake resulting from the specific situation.

Bioassays are expensive! Use them when they are called for. But use them appropriately

Second, new personnel assigned to a maintenance shop, where tritium containing devices/equipment are worked, need a bioassay prior to beginning work in that shop. This bioassay will determine if there was a tritium uptake prior to his/her new assignment.

Third, personnel being reassigned from a shop where tritium items were worked should receive a bioassay prior to departure. This will establish the presence or absence of tritium in the reassigned individual.

Routine bioassays provide the only reliable monitoring and dose tracking of those who routinely work with these devices.

Finally, routine bioassays (monthly) must be performed on those individuals who routinely do maintenance on tritium containing devices/equipment. Routine bioassays provide the only reliable monitoring and dose tracking of those who routinely work with these devices.

They also provide a backup to area wipe surveys, and provide an ongoing picture of the radiological condition of the work area. Bioassays are expensive . They should be used when called for, but only when appropriate!

For information on bioassay procedures and to receive bioassay kits, contact the US Army Center for Health Promotion and Preventive Medicine at DSN 584-3548 or COM (410) 436-3548 and FAX DSN 584-8261 or COM (410) 436-8261.

TACOM-Rock Island Safety

Visit us on the WEB!
Http://www.tri.army.mil/LC/R/RS/safe.htm

CAUTION

RADIOACTIVE MATERIAL

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